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Occurrence of a New *Kurasawatrechus* (Coleoptera, Trechinae) near the Pacific Coast of Central Japan¹⁾

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Abstract A new anophthalmic trechine beetle belonging to the genus *Kurasawatrechus* is described from a pothole near Lake Hamana-ko on the Pacific coast of Central Japan. It is isolated both taxonomically and geographically. The new name given is *Kurasawatrechus ryugashiensis*.

The Koreo-Japanese genus *Kurasawatrechus* is an assemblage of small anophthalmic trechine beetles primarily endogean in nature. In Japan, its members are widespread in central and northeastern Honshu east of the Suzuka Mountains, but the distributional range is northerly and does not reach the Pacific coast of central Honshu, with the exception of certain particular areas consisting either of recent volcanoes (*e.g.*, Fuji and Hakoné areas) or of mountains that run from north to south (*e.g.*, the Suzukas and their southward continuation) (*cf.* UÉNO, 1988, pp. 44–47, fig. 5). The narrow coastal areas in this part of Honshu are mainly occupied by the members of the group of *Trechiana habei* (*cf.* UÉNO, 1988, p. 42, fig. 4 A), which coexist with *Kurasawatrechus* only in several exceptional places. It is, therefore, most unexpected that an isolated species of the latter genus was recently discovered in a pothole lying on a low hill, which is only 19 km apart from the shore of the Pacific Ocean and only 4 km distant from the southern edge of the hilly area to the northeast of Lake Hamana-ko.

This pothole lies at the central part of the San'en limestone area, one of the calcareous lands first investigated biologically in the Japanese Islands. However, a rich cave fauna has been known only from Ja-ana Cave lying near the western end of the limestone area (*cf.* UÉNO, 1954, pp. 30–35, fig. 1; 1955, pp. 57–64). Other caves have been repeatedly investigated, but no trechines have been turned up, with the exception of *Trechiana mammalis* S. UÉNO (1987, p. 30, figs. 1–3), recently discovered in a rhyolitic cave about 30 km inland of Ja-ana Cave and outside of the San'en limestone area. This seeming blank has long been considered very strange, since the whole limestone area should be included in the distributional range of the group of *Trechiana habei* from the ordinary viewpoint of zoogeography.

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held at Nagoya on November 14–15, 1987, an excursion was made to the well-known commercialized cave called Ryûgashi-dô (formerly called Tabataké-no-ana; No. 10 in fig. 1, in UÉNO, 1954, p. 30). A small pothole lying above the commercialized cave was explored and biologically investigated at the same time, and was found to be inhabited by a *Kurasawatrechus*. Only a casual glance was needed for recognition of its novelty, because of its peculiarly elongate and subparallel-sided facies. Unfortunately, all the three specimens collected at that time were females, but a series of males of the same species were later obtained by the efforts of the staff of the Ryûgashi-dô Office.

In this paper, I am going to describe the new species under the name of *Kurasawatrechus ryugashiensis*. Its derivation is not certain as it is widely isolated both taxonomically and geographically from its congeners, nor is it possible for me to elucidate how its ancestor could come down to near the shore of the Pacific Ocean. It is, however, important to introduce it into science, since its occurrence in the San'en limestone area seems to open up the possibility that other species of the same genus may exist in the supposed distributional range of the group of *Trechiamma habei*.

The abbreviations used herein are the same as those explained in other papers of mine.

Before going into further details, I wish to express my deep indebtedness first of all to the staff of the Ryûgashi-dô Office, Mr. Yûji INAGAKI in particular, for their kindness in giving me permission and help to investigate the faunas of the caves under their care. Heartly thanks are also due to Professor Yoshiaki NISHIKAWA, Mr. Shizuya HONMA and Mr. Hiroshi IWASAKI for their kind aid extended to me in the field.

***Kurasawatrechus ryugashiensis* S. UÉNO, sp. nov.**

[Japanese name: Ryûgashi-mekura-chibigomimushi]

(Figs. 1–3)

Length: 2.45–2.80 mm (from apical margin of clypeus to apices of elytra).

An isolated species belonging to the group of *K. eriophorus*. Not unlike *K. longulus* S. UÉNO (1973, p. 16, figs. 1–3; 1979, p. 117; 1985, p. 87) in general appearance, but the coloration is obviously darker, the genae are subangulately convex at the posterior parts, the prothorax is wider at the base, with much ampler basal part and bearing denser hairs on the disc, the elytra are more strongly convex, and the aedeagal apical lobe is broader at the base and ventrally curved at the apex. Similar to *K. fujisanus* S. UÉNO (1971, p. 339, figs. 1–8; 1978, p. 34; 1985, p. 87, pl. 16, fig. 15) in the configuration of male genitalia, but the facies are markedly different, the 4th elytral stria is not shortened, and the coloration is much darker.

Body elongate and rather parallel-sided, with large fore part and narrow hind part. Colour dark reddish brown, shiny, with mandibles, segments 2–4 of antennae, and lateral margins of prothorax more or less darker; palpi, apical halves of antennae, ventral surface of hind body, and legs light reddish brown to yellowish brown.

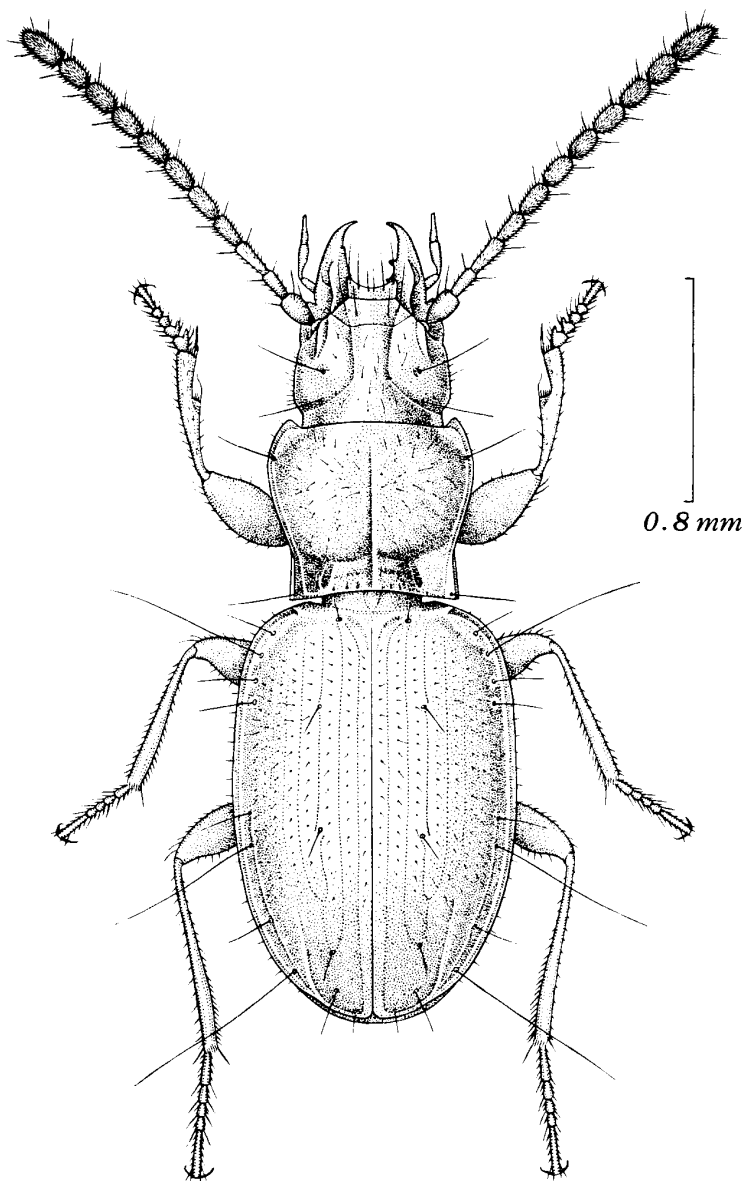


Fig. 1. *Kurasawatrechus ryugashiensis* S. UÉNO, sp. nov., ♂, from Ryûgashi-no-taté-ana Pot at Tabataké in Inasa-chô.

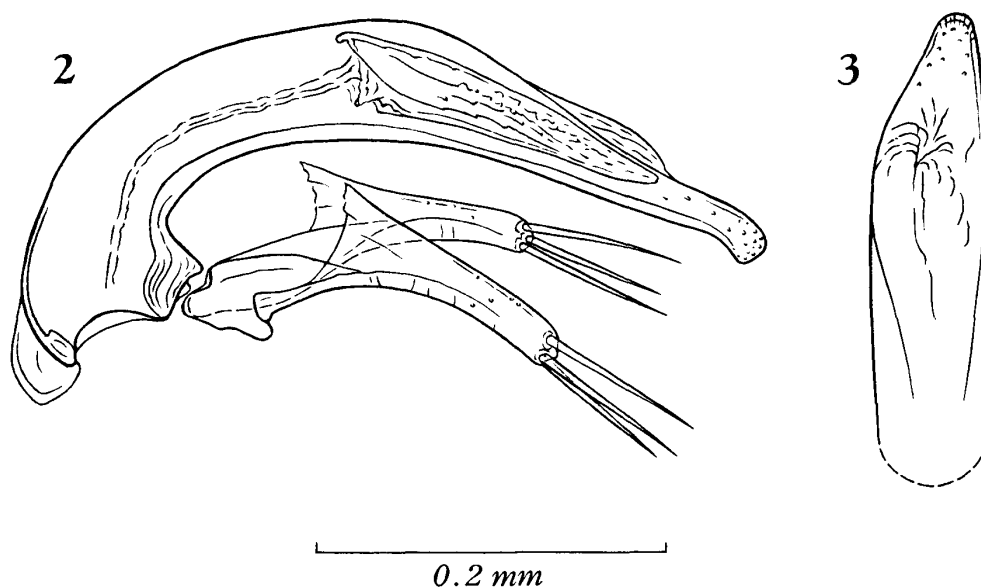
Head large and wide, obviously wider than long, and depressed above, with deep entire frontal furrows which are subangulate at middle and widely divergent behind towards neck constriction; frons and supraorbital areas moderately convex and sparsely covered with fairly long hairs; genae sparsely covered with erect hairs, almost flat at the anterior parts but subangulately convex before neck constriction, which is deep and sharply marked at the sides; neck very wide; labrum widely emarginate at apex, whose median portion is briefly straight; mandibles stout, arcuate at the apical parts; mentum tooth porrect, distinctly but not deeply emarginate at the tip; palpi short and

fairly thick, excepting subulate terminal segments; antennae submoniliform, reaching basal three-tenths of elytra in ♂, usually a little shorter than that in ♀, segment 2 about as long as segment 4 or 5 and about four-fifths as long as segment 3, segments 7–10 each ovoid and about twice as long as wide, terminal segment the largest, about as wide as scape and evidently longer than the latter.

Pronotum large, ample, wider than head, a little wider than long, widest at about two-thirds from base, and a little more rapidly contracted anteriorly than posteriorly; PW/HW 1.22–1.29 (M 1.25), PW/PL 1.12–1.16 (M 1.14), PW/PA 1.22–1.27 (M 1.25), PW/PB 1.22–1.32 (M 1.26); surface convex and rather densely covered with fairly long suberect hairs; sides distinctly reflexed throughout, sparsely ciliated before the widest part, gently arcuate in front, distinctly but not deeply sinuate at about basal fourth, and then either subparallel or very slightly divergent towards hind angles, which are usually somewhat sharp but sometimes rectangular; subparallel parts of side margins more or less distinctly notched; apex almost straight or very slightly arcuate, about as wide as base, PA/PB 0.97–1.04 (M 1.01); base either straight or slightly emarginate; front angles sharp, well produced forwards; median line deep, becoming wider and deeper in basal area; apical area indistinctly wrinkled; basal transverse impression twofold, both narrow, deep, continuous, parallel to basal margin, and interrupted on each external side by a narrow oblique impression; the area between the oblique impression and marginal gutter somewhat convex, so as to restrict the basal fovea to the external side of the anterior furrow of transverse impression; no postangular carinae; basal area behind the posterior furrow of transverse impression longitudinally strigose. Scutellum absent.

Elytra oblong-ovate, wider than prothorax, much longer than wide, widest at about three-sevenths from bases, and a little more gradually narrowed towards apices than towards bases; EW/PW 1.35–1.43 (M 1.39), EL/EW 1.47–1.52 (M 1.50); surface convex, especially at the sides and in apical areas, with steep apical declivity; shoulders not sharply defined, with prehumeral borders arcuate throughout; sides narrowly bordered and fringed with hairs, the borders becoming wider at the humeral parts, very feebly arcuate at middle, and hardly emarginate before apices, which are rather widely and almost conjointly rounded; striae moderately impressed and indistinctly punctate on the disc but obliterated at the side, 1–3 and sometimes 4 almost entire, 5 slight, 6–7 usually obsolete, 8 more or less impressed behind the middle set of marginal umbilicate pores; scutellar striole short; apical striole long, moderately impressed near apex but becoming shallower in anterior part, which is nearly straight and usually directed to stria 5, rarely to the site of stria 7 on one elytron; intervals flat, each bearing an irregular row of suberect pubescence; apical carina obtuse.

Microsculpture of head distinct, consisting of polygonal meshes which are isodiametric on frons but more or less wide on other parts; that of pronotum and elytra also distinct but less deeply impressed than on head, being composed of irregular polygonal meshes. Chaetotaxy normal; submentum provided with a transverse row of eight setae; elytral stria 3 with two setiferous dorsal pores at about basal fourth



Figs. 2–3. Male genitalia of *Kurasawatrechus ryugashiensis* S. UÉNO, sp. nov., from Ryûgashi-no-taté-ana Pot at Tabataké in Inasa-chô; left lateral view (2), and apical part of aedeagus, dorso-apical view (3).

and around the middle. Ventral surface pubescent throughout; anal sexual setae normal. Legs short and fairly stout; protibiae moderately dilated towards apices, gently bowed, entirely pubescent, and not externally grooved; tarsi fairly thick, segment 1 shorter than segments 2–3 together in mesotarsus, longer than segments 2–3 together but shorter than segments 2–4 together in metatarsus; in ♂ protarsal segments 1 and 2 moderately dilated and sharply spurred inwards at apices.

Male genital organ very small though moderately sclerotized. Aedeagus about two-sevenths as long as elytra, tubular, moderately arcuate in proximal half but almost straight behind middle, with small basal part rather abruptly curved ventrad; basal orifice small, with the sides shallowly emarginate; sagittal aileron small though porrect; viewed laterally, apical lobe narrowly prolonged, abruptly curved ventrad at the apical part and subtruncated at the extremity; viewed dorsally, apical lobe elongated subtriangular, inclined to the left, and narrowly rounded at the extremity. Copulatory piece large and elongate, nearly a half as long as aedeagus, rolled, and attenuate towards apex, with scaly surface. Styles fairly slender, left style obviously larger than the right, each bearing three stout setae at the apex.

Type series. Holotype: ♂, 29–XII–1987, Y. INAGAKI leg. Allotype: ♀, 16–XI–1987, S. UÉNO leg. Paratypes: 2 ♀♀, 16–XI–1987, S. UÉNO & H. IWASAKI leg.; 1 ♀, 14–XII–1987, Y. INAGAKI leg.; 4 ♂♂, 1 ♀, 28–XII–1987, Y. INAGAKI leg. All deposited in the collection of the Department of Zoology, National Science Museum (Nat. Hist.), Tokyo.

Type locality. Pothole called Ryûgashi-no-taté-ana, at Tabataké of Inasa-chô in Shizuoka Prefecture, on the Pacific coast of Central Japan.

Further specimen examined. 1 ♂ (teneral), Tachisu-no-shadô Cave, Mitaké, Inasa-chô, Shizuoka Pref., 8-I-1988, Y. INAGAKI leg. (NSMT).

Notes. It is difficult to determine the true affinity of this interesting new species at the present moment. It is isolated both taxonomically and geographically. The Abé-tôgé, which harbours *K. moritai* S. UÉNO (1979, p. 118), is geographically nearest to Ryûgashi-no-taté-ana, but is not only distant for about 82 km to the northeast but also separated by two large rivers, the Tenryû-gawa and the Ôi-gawa. Topographically, the Sanpuku-tôgé on the Akaishi Mountain Range, which is the type locality of *K. brevicornis* S. UÉNO (1979, p. 114, figs. 1-3), is nearer to Ryûgashi-no-taté-ana, but it is about 90 km distant to the north-northeast and is on the other side of the Tenryû-gawa Valley. Mt. Nyûgasa-yama, the type locality of *K. longulus*, is further 36 km north of the Sanpuku-tôgé, and the distributional range of *K. fujisanus* is at least 100 km distant to the east-northeast. It is possible that *K. ryugashiensis* is derived from an ancestor native to the Akaishi Mountains, but the trechine seems to have been isolated on the hills north or northeast of Lake Hamana-ko long enough to develop many peculiarities, which cannot be found in any of the other known species belonging to the group of *K. eriophorus*.

Ryûgashi-no-taté-ana (also called Toda-no-taté-ana) is a small pothole about 20 m deep, lying near the southwestern foot of Ryûgashi-yama at an altitude of about 130 m. It may belong to the same cave system as the well known commercialized cave, Ryûgashi-dô (formerly called Tabataké-no-ana), though actual route connecting the two caves has not been found. At about 13 m below the surface, there is a slanting terrace, whose floor is thickly covered with soil mingled with rock debris. It is this part of the pothole that is inhabited by *K. ryugashiensis*. The trechine is always found on stones buried in the soil deposit, usually at a depth of 10-20 cm.

The single male specimen known from Tachisu-no-shadô Cave, which is located about 4.5 km east of Ryûgashi-no-taté-ana, seems to belong to the same species. It is, however, so teneral that definite identification cannot be made. It was impossible even to make dissection of its genitalia because of the extreme fragility of the specimen.

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